

AMENDMENTS TO THE DRAWINGS:

The attached four (4) sheets of drawings include changes to Figures 4, 5, 6, and 7. Figure 4 has been amended without prejudice to include text descriptions in elements 34, 36, 38, and 40. Figure 5 has been amended to include text descriptions in elements 43, 49, and 57 and to change the text descriptions in elements 42, 44, 46, 48, 50, 52, 54, 56, and 58 from French to English. Figures 6 and 7 have been amended to change the chart labels from French to English. No new matter has been added.

Attachment: Four (4) Replacement Sheets

REMARKS

I. Introduction

With the cancellation herein without prejudice of claims 19 to 22, claims 14 to 18 and 23 to 25 are pending in the present application. In view of the foregoing amendments and the following remarks, it is respectfully submitted that all of the presently pending claims are allowable, and reconsideration is respectfully requested.

Applicant notes with appreciation the acknowledgment of the claim for foreign priority and the indication that all certified copies of the priority documents have been received.

Applicant thanks the Examiner for considering the previously filed Information Disclosure Statement, PTO-1449 paper and cited references.

II. Objections to the Drawings

The drawings were objected to on multiple grounds.

As regards the objection under 37 C.F.R. § 1.83(a) for failing to show every feature of the invention specified in the claims, the Examiner indicates at pages 2 to 3 of the Office Action that "the progression of the falling speed of the control rod in the lower damping portion using BOTH a HIGHER value AND a LOWER value for the radial passage gap must be shown or the feature(s) canceled from the claim(s)" (emphasis in original). In this regard, Applicants respectfully direct the Examiner's attention to the Substitute Specification at, e.g., page 4, lines 9 to 12, which indicates that the higher value for the radial gap is used in the establishing step b) and the lower value is used in the establishing step c). In other words, the higher value is used for establishing the progression of the falling speed of the control rod in the lower damping portion and the lower value is used for establishing a maximum elevated pressure produced in the liquid contained in the lower damping portion. See page 3, lines 18 to 26 of the Substitute Specification. It is noted that these steps are sufficiently illustrated as elements 44 and 46, respectively, in Figure 5. Moreover, it is respectfully submitted that, in view of the foregoing, there is nothing objectionable with regard to the curves as illustrated in Figures 6 and 7.

As regards the objection to Figures 4, 5 and 6, Figures 4, 5, and 6 have been amended herein without prejudice. Figure 4 has been amended without

prejudice to include text descriptions in elements 34, 36, 38, and 40, support for which can be found in the Substitute Specification at, e.g., page 10, line 32 to page 11, line 2. Figure 5 has been amended to include text descriptions in elements 43, 49, and 57, support for which can be found in the Substitute Specification at, e.g., page 11, lines 15 to 20, page 15, lines 26 to 30, and page 18, lines 10 to 14, and to change the text descriptions in elements 42, 44, 46, 48, 50, 52, 54, 56, and 58 from French to English. Figure 6 (as well as Figure 7) has been amended to change the chart labels from French to English. No new matter has been added. It is respectfully submitted that these amendments obviate the objection to Figures 4, 5, and 6.

In view of all of the foregoing, withdrawal of these objections is respectfully requested.

III. Rejection of Claims 14 to 18 Under 35 U.S.C. § 112, First Paragraph

Claims 14 to 18 were rejected under 35 U.S.C. § 112, first paragraph as based on a non-enabling disclosure.

In this regard, the Examiner contends at pages 4 to 5 of the Office Action that "[s]teps 50, 52, 54, 56, and 58 critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure." Applicants respectfully disagree. The Specification makes clear that the first part of the method (steps 40, 42, 44, 46, and 48) and the second part of the method (steps 50, 52, 54, 56, and 58) can be used independently of each other. See, e.g., Substitute Specification at page 21, lines 8 to 23 and page 23, line 29 to page 24, line 2. It would therefore be clear to one of ordinary skill in the art from reading the Specification that the second part of the method is not essential to practicing the first part of the method, and vice-versa. Thus, it is respectfully submitted that claims 14 to 18 are fully enabled by the disclosure, including the Specification. Accordingly, withdrawal of this rejection is respectfully requested.

IV. Rejection of Claims 14 to 18 Under 35 U.S.C. § 112, Second Paragraph

Claims 14 to 18 were rejected under 35 U.S.C. § 112, second paragraph as being incomplete for omitting essential steps.

As indicated above, the Specification makes clear that the first part of the method (steps 40, 42, 44, 46, and 48) and the second part of the method (steps

50, 52, 54, 56, and 58) can be used independently of each other and that the steps included in the second part of the method are not essential to practicing the first part of the method. See Substitute Specification at page 23, line 29 to page 24, line 2. Accordingly, withdrawal of this rejection is respectfully requested.

V. Rejection of Claims 14 to 22 Under 35 U.S.C. § 112, Second Paragraph

Claims 14 to 22 were rejected under 35 U.S.C. § 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention.

As an initial matter, claims 19 to 22 have been canceled herein without prejudice, thereby rendering moot the present rejection with regard to claims 19 to 22.

As regards the rejection of claim 14, from which claims 15 and 16 depend, for reciting “each of the guide tubes comprising a lower damping portion which comprises at least a portion of reduced inside diameter,” all that is required to satisfy the definiteness requirement of 35 U.S.C. § 112 is that “the scope of the claim is clear to a hypothetical person possessing the ordinary level of skill in the pertinent art.” See MPEP § 2171. In this regard, it would be clear to one of ordinary skill in the art that the “at least a portion of reduced inside diameter” is not limited to any particular portion of the lower damping portion of the guide tubes. Each of the guide tubes has an inside diameter and a lower damping portion wherein at least a section of the guide tube has a reduced inside diameter. As such, it is respectfully submitted that claim 14 fully complies with the definiteness requirement of 35 U.S.C. § 112, second paragraph, and that there is no requirement under 35 U.S.C. § 112 to further limit claim 14. Notwithstanding the foregoing, claim 14 has been amended herein without prejudice to change “at least a portion of reduced inside diameter” to --at least a section of reduced inside diameter--, so as to avoid any potential confusion from the recitation of the term “portion” in connection with two different features. No new matter has been added.

As regards the rejection of claims 17 and 18, while Applicants do not necessarily agree with the merits of this rejection, to facilitate matters, claim 17 has been amended herein without prejudice to change “a maximum statistical value” to --the maximum statistical value--, and claim 18 has been amended herein without prejudice to change “a minimum statistical value” to --the minimum statistical value--.

In view of all of the foregoing, withdrawal of this rejection is respectfully requested.

VI. Double Patenting

Claims 19 to 22 were provisionally rejected on the ground of nonstatutory obviousness-type double patenting. In this regard, claims 19 to 22 have been canceled herein without prejudice, thereby rendering moot the present rejection. Accordingly, withdrawal of this provisional rejection is respectfully requested.

VII. Rejection of Claims 14 to 18 Under 35 U.S.C. § 103(a)

Claims 14 to 18 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 3,562,109 ("Bezold et al."). It is respectfully submitted that Bezold et al. do not render unpatentable the present claims for at least the following reasons.

Claim 14 relates to a method for designing a nuclear fuel assembly. As amended herein without prejudice, claim 14 recites the steps of: calculating a falling speed of the control rod upon entry into the lower damping portion when the control cluster falls in an event of a shutdown of the nuclear reactor; calculating, based on the falling speed, a progression of the falling speed of the control rod in the lower damping portion; calculating, based on the progression of the falling speed of the control rod in the lower damping portion, a maximum elevated pressure produced in the fluid contained in the lower damping portion; and calculating, based on the maximum elevated pressure, a maximum circumferential stress produced in the lower damping portion. Claim 16 has been amended herein without prejudice to accord with amended claim 14. No new matter has been added, as support may be found in the Substitute Specification at, e.g., page 11, line 15 to page 15, line 30.

Bezold et al. relate to a hydraulic fall-brake or shock absorber for nuclear reactor control rods. As regards Figures 3a and 3b of Bezold et al., it is noted that the depicted curves were obtained through measurements carried out after having designed and manufactured a nuclear fuel assembly. This is particularly evident by the way through which the optimization is implemented -- the optimization takes place after the assembly has been manufactured. See, e.g.,

col. 4, lines 5 to 9. In this regard, Bezold et al. do not disclose, or even suggest, conducting corresponding calculations before manufacturing the assembly.

It is further noted that Bezold et al. are only interested in avoiding damages to the control rod -- not avoiding damages to the guide tube or a damping portion thereof. See, e.g., col. 1, lines 49 to 54. In this regard, Bezold et al. do not disclose, or even suggest, calculating, based on a maximum elevated pressure, a maximum circumferential stress produced in a lower damping portion as recited in claim 14.

As indicated above, Bezold et al. do not disclose, or even suggest, all of the features recited in claim 14. As such, it is respectfully submitted that Bezold et al. do not render unpatentable claim 14.

Claims 15 to 18 ultimately depend from claim 14 and therefore include all of the features recited in claim 14. As such, it is respectfully submitted that Bezold et al. do not render unpatentable these dependent claims for at least the same reasons set forth above in support of the patentability of claim 14.

In view of all of the foregoing, withdrawal of this rejection is respectfully requested.

VIII. Rejection of Claims 19 to 22 Under 35 U.S.C. § 103(a)

Claims 19 to 22 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Bezold et al. and either of U.S. Patent No. 5,076,995 ("Canat") and U.S. Patent No. 3,762,994 ("Kunzel"). Applicants note that claims 19 to 22 have been canceled herein without prejudice, thereby rendering moot the present rejection. Accordingly, withdrawal of this rejection is respectfully requested.

IX. Conclusion

It is therefore respectfully submitted that all of the presently pending claims are allowable. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

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Attachments